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**Ota**

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(54) **LASER TREATMENT APPARATUS**

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(58) **Field of Search** ..... **606/3, 5, 10-13, 606/17**

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

4,069,823 A \* 1/1978 Isakov et al. .... 606/11  
4,388,924 A 6/1983 Weissman et al.

5,098,426 A \* 3/1992 Sklar et al. .... 606/5  
5,408,409 A 4/1995 Glassman et al.  
5,489,758 A 2/1996 Nihei et al.

**FOREIGN PATENT DOCUMENTS**

EP 0 880 941 A1 12/1998  
EP 1 031 324 A1 8/2000  
WO WO 99/07438 2/1999

\* cited by examiner

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(57) **ABSTRACT**

A laser treatment apparatus for irradiating a treatment part with a laser beam for treatment is disclosed. The apparatus includes a treatment light irradiation unit including a treatment light source which emits the treatment laser beam, an irradiation optical system which delivers the treatment laser beam emitted from the light source to irradiate the treatment part, and a laser emission end unit internally provided with a part of the irradiation optical system. The apparatus further includes a movement unit which moves the emission end unit with respect to the treatment part, a determination unit which determines an irradiation position of the treatment laser beam, and a control section which transmits a control signal to the movement unit based on a determination result by the determination unit and controls laser irradiation.

**6 Claims, 10 Drawing Sheets**

